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EMPOASCA (HOMOPTERA: CICADELLIDAE) FROM HIGHLAND CROPS OF COLOMBIA¹

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Corn, potatoes, beans, and several other legume crops grown in the mountainous areas of Colombia are attacked by leaf hoppers of the genus *Empoasca*. The species of this genus have been thoroughly studied in the Nearctic Region, but the Neotropical forms, with the exception of the Mexican species, are little known (Young, 1952). Therefore, the specimens of these insects collected from the crops of the *clima medio* and *tierra fría* (elevation approximately 1,000 to 2,000 m. and 2,000 to 3,000 m. respectively) of Colombia were critically examined by the authors. Six species were found to be abundant: *fabae* (Harris), *prona* Dav. and DeL., *bispinata* Dav. and DeL., and three species described as new in this paper.

The green-colored *Empoasca* tend to fade rapidly after death and in many species the markings become obscured or even change. There is also great variation in intensity of color and in the size of the markings in freshly killed specimens. The color descriptions in this paper are based on well-marked dead specimens. The size data given for the species are based on the average length (from the apex of the crown to the apex of the closed wings) of the best specimens of each series. Although color and length aid in

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separating species of this genus, the male genital structures are diagnostic of the species and reference must be made to these structures in order to identify the species properly. The collections were made from crops near the localities cited and the elevations given are close approximations of the elevations of the actual collection sites.

Types of the species described as new are deposited in the collection of D. M. DeLong and in the United States National Museum.

Empoasca fabae (Harris)

E. fabae is a highly variable species with an involved synonymy (Medler, 1942). It is a widespread pest of many crops in the Neotropics which during the summer months extends its range deeply into the Nearctic Region. In Colombia it is the most important insect pest of beans and during some seasons completely destroys fields which have been left unprotected. The control of this species as a bean pest in Colombia has been studied by Losada (1948) and Benavides (1955).

Length. Males, 3.34 mm.; females, 3.54 mm.

Color. The crown is pale green with a pair of dark green spots on each side of its disk and with a white, median, longitudinal stripe. A spot near each eye is white. The pronotum is pale green with a series of round, white spots along its anterior margin. The scutellum is pale green with its disk white. The wings are pale green, hyaline. The face is pale yellow with a white, median, longitudinal stripe and with a pair of white, transverse, dorsal stripes. The apex of the clypellus is dark green.

Male genitalia. The apices of the pygofer are rounded and bear a row of spines. The ventral processes of the pygofer are straight with their dorsal margins appearing swollen and with their apices truncate. The ventral processes of the Colombia specimens vary slightly from those of the North American *fabae*. Dr. D. A. Young (personal correspondence) noted that this character is variable in *fabae* from the United States of America and Ing. José Guevara C. (personal conversation) noted that pygofer processes of the *fabae* from Mexico are variable also. The Colombian specimens are therefore referred to *fabae* pending the evaluation of these differences. The anal hooks are broad at their bases and narrow on their posterior margins to form pointed apices. The plates are long, bend dorsad near their center, and bear a row of long hairs. The styles are slender with their apices curved laterad. The connective is straight and hyaline. The base of the

aedeagus is long, straight, and slender. The phallicata is rectangular.

This species is the most common and damaging of the *Empoasca* found in the *clima medio* and is described from many specimens collected from beans, corn, *Crotalaria*, cowpea, soybeans, and "weeds" at Palmira, V. del Cauca (elev. 1,000 m.), and Medellín, Ant. (elev. 1,500 m.).

Empoasca prona Dav. and DeL.

Prona is a slender leaf hopper which, although superficially resembling *fabae*, is larger and more strikingly marked than *fabae* and has distinctive male genitalia.

Length. Males, 3.83 mm.; females, 3.85 mm.

Color. The crown is pale green with a white, median, longitudinal line and with a pair of white spots near the posterior margin. The ocelli are outlined in white. The pronotum is pale green with a series of white spots along its anterior margin and with a basal, longitudinal, white band. The scutellum is white with its basal angles dark green. The wings are light green, hyaline. The face is yellow with a longitudinal white bar near the center of its dorsal margin and with the apex of the clypellus dark green.

Male genitalia. The genital capsule is similar to that of *fabae*. The ventral processes of the pygofer are slender and long, and their apices are sharply pointed and curve abruptly laterad. The anal hook is sharply pointed and curves gently anteriorly. The phallicata is broad, its apex is rounded, and its ventral margin is conspicuously thickened.

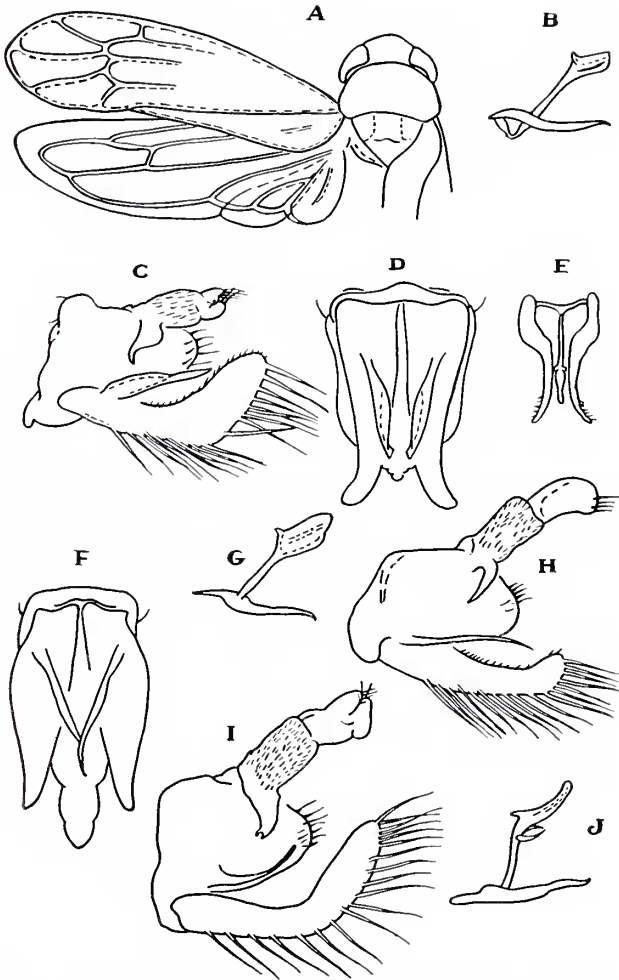
This species was described by Davidson and DeLong (1940) from specimens from Costa Rica, Brazil, and Mexico. In the *clima medio* of Colombia it occurs in small numbers and has been collected from beans and *Crotalaria* at Bello, Ant. (elev. 1,500 m.), and from beans, cowpea, and soybeans at Palmira, V. del Cauca. *Prona* has also been taken from potatoes at Las Palmas, Ant. (elev. 2,300 m.), and La Ceja, Ant. (elev. 2,300 m.); from *Crotalaria*, and from vetch, beans, corn, peas, and "weeds" at Bogotá, Cund. (elev. 2,700 m.).

Empoasca papae n. sp.

In general appearance this species is very similar to *prona* but it is slightly different in color and has genitalia approaching those of *cothurna* Dav. and DeL.

Length. Males, 3.90 mm.; females, 4.00 mm.

Color. The crown is pale green with its anterior margin bordered



Empoasca fabae A. head, thorax and wings of female, dorsal view; B. aedeagus and styles, lateral view; C. genital capsule, lateral view; D. genital capsule, ventral view; E. aedeagus and styles, ventral view. *E. pronae*—F. genital capsule, ventral view; G. aedeagus and styles, lateral view; H. genital capsule, lateral view. *E. bispinata*—I. genital capsule, lateral view; J. aedeagus and styles, lateral view.

with tan. The pronotum is pale green with its anterior margin bearing a series of white spots. The scutellum is pale green with the basal angles outlined in white. The wings are pale green, hyaline. The face is uniformly greenish yellow.

Male genitalia. Genital capsule, plates, styles, and connective are similar to those of *fabae*. The ventral processes of the pygofer are nearly straight; their apices are blunt and somewhat flattened. The anal hook is broad at its base and bifurcate, the posterior lobe being small and blunt while the anterior lobe is long, slender, and curved mesad. The phallicata is slender and its apex is extended into a small dorsal point.

This species is very numerous in the Department of Nariño and is described from series of specimens collected at Pasto, Nar. (elev. 2,800 m.), 28 Sept. 1954, from potatoes, by M. Revelo; at La Ceja, Ant., 18 Jan. 1955, from potatoes, by E. Cardona; at Pasto, Nar., 15 July 1955, from potatoes and alfalfa, by R. F. Ruppel; at Las Palmas, Ant., 2 Sept. 1954, from potatoes, by J. Medina; and at Pasto, Nar., 12 April 1954, from beans, by M. Benavides.

The name of the species is derived from the colloquial Spanish word *papa*.

***Empoasca scinda* n. sp.**

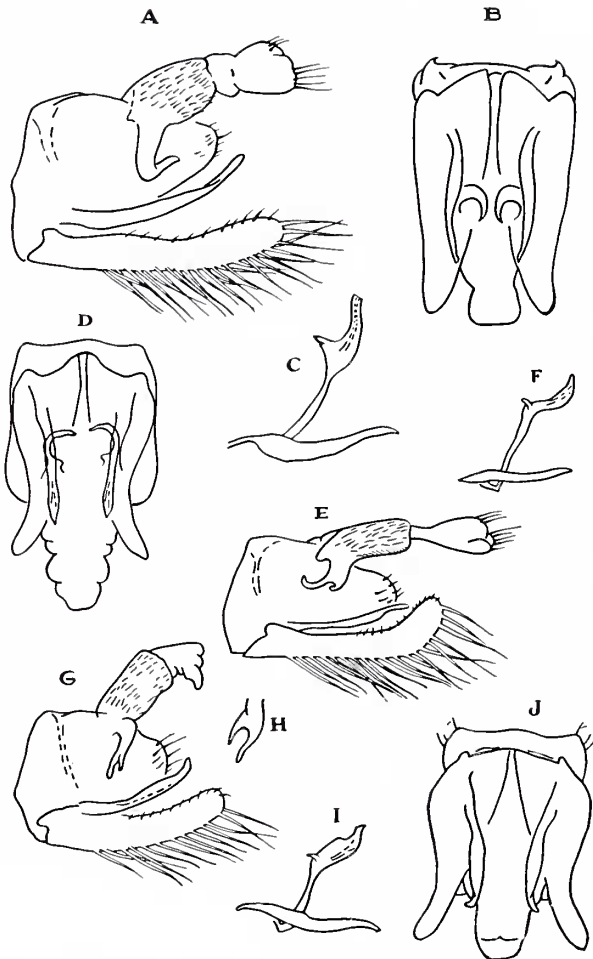
In general appearance this species closely resembles both *prona* and *papae*, but the coloration is slightly different and the male genital features are distinct.

Length. Males, 3.63 mm.; females, 3.84 mm.

Color. The disk of the crown is green, the anterior margin bordered with tan. The ocelli are conspicuously margined with white. The pronotum is light green with its anterior margin spotted with white. The scutellum is light green with its basal angles outlined in white. The wings are light green, hyaline. The face is a uniform yellow-green with a small, white spot near each eye.

Male genitalia. The genital capsule is similar to that of *fabae*. The ventral processes of the pygofer are long, bent slightly dorsad near their proximal third, and their apices are pointed and bent sharply dorsolaterally. The anal hooks are bifurcate with their lateral lobes broader and shorter than their mesal lobes. The dorsal margin of the phallicata is roundly notched on its distal third and its apex is prolonged into a sharp point.

This species is common on the Sabana de Bogotá and is described from series collected from corn near Bogotá, Cun., 4 Aug. 1954, by M. Revelo, and from beans and "weeds" near Bogotá.



Empoasca antioquinac—A. genital capsule, lateral view; B. genital capsule, ventral view; C. aedeagus and styles, lateral view. *E. papac*—D. genital capsule, ventral view; E. genital capsule, lateral view; F. aedeagus and styles, lateral view. *E. scinda*—G. genital capsule, lateral view; H. left pygofer hook, caudal view; I. aedeagus and styles, lateral view; J. genital capsule, ventral view.

Cun., 9 Sept. 1954, by M. Revelo.

The name used is descriptive of the characteristically notched phallicata.

***Empoasca antioquinae* n. sp.**

This is a large dark green species with unique male genitalia. To date, no females can be definitely associated with the male specimens, so that the following description is based on the male.

Length. Males, 4.00 mm.

Color. The crown is pale green with the ocelli brown. The pronotum is green with the anterior margin orange-tan. The scutellum is green with the basal angles orange-tan. The wings are green, hyaline. Orange stripes extend along the commissural suture, the claval suture, and the proximal portion of the costal margin of the wing. The face is tan with lora and clypellus green and with a white spot beneath each ocellus.

Male genitalia. The genital capsule is similar to the others described in this paper. The ventral processes of the pygofer curve slightly dorsad and, in ventral view, are slightly S-shaped. The anal hooks are large, bent sharply meso-caudally near their middles, and their apices are sharply pointed. The phallicata is recurved and tapers gradually to a truncate apex.

This species is described from a series of male specimens collected from *Crotalaria juncea* near La Ceja, Ant., 18 Jan. 1955, by E. Cardona, and from Imperial grass at Rionegro, Ant. (elev. 2,300 m.), 19 Aug. 1955, by C. Carmona.

Empoasca bispinata Dav. and DeL.

This species, described from the State of Chiapas, Mexico (Davidson and DeLong, 1943), has been collected from peas and corn near Bogotá, Cund., and from a light at Bello, Ant.

Length. Males, 3.77 mm.; females, 3.86 mm.

Color. The vertex is golden with a pair of round, green spots on its disk. The pronotum and scutellum are golden with the basal angles of the scutellum outlined in white. The wings are translucent, golden. The face is pale golden-tan with the cypellus green.

Male genitalia. The genital capsule is similar to that of *fabae*. The ventral processes of the pygofer are slender, sharply pointed, and curve gently dorso-caudad. The anal hooks are broad and their apices are divided in small anterior and posterior processes. A pair of sharply-pointed spines which curve meso-caudad are located on the base of the aedeagus near the phallicata. The phalli-

cata is slender and curves dorsad.

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